Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original): A method of modeling dielectric losses in a transmission line, the method comprising:

modeling a resistance, a self-inductance, and a self-capacitance for a line as a lumped element circuit having a first port and a second port, where a signal is received on the first port; and

modeling a dielectric loss as a scattering matrix connected to the second port.

Claim 2 (original): The method of claim 1, wherein the scattering matrix uses values based upon a low-loss condition wherein the intrinsic impedance of the line is unaffected by losses, whereby reflection coefficients for the first and second ports are defined to be zero if the scattering matrix is normalized to the intrinsic impedance.

Claim 3 (currently amended): The method of claim 1, wherein the scattering matrix uses values that vary with a frequency of [[the]] <u>a</u> signal <u>transmitted via the transmission line</u>.

Claim 4 (currently amended): The method of claim 1, wherein the scattering matrix uses values that are related to the dielectric constant of a material in which the <u>transmission</u> line is embedded.

Claim 5 (original): The method of claim 1, further comprising calculating the resistance, inductance, and capacitance.

Claim 6 (original): The method of claim 1, further comprising modeling a skin effect resistance and a skin effect inductance using an R-L tank circuit connected to the second port.

Claim 7 (currently amended): The method of claim 1, further comprising modeling the dielectric losses using circuit simulation software.

Claim 8 (currently amended): A method for simulating a transmission line comprising;

determining a resistance of a transmission line;

determining a self-inductance of the line;

determining a self-capacitance of the line;

creating a computer model of the line as a schematic having first and second ports;

modeling the resistance as a resistor in series with an inductor that represents the self-inductance;

modeling the self-capacitance as a capacitor connected to the line; and

modeling a dielectric loss as a scattering matrix connected to the second port, wherein the scattering matrix ~~[S]~~ represents conductance of the transmission line ~~lines~~ across a ~~broad~~ band of frequencies.

Claim 9 (original): The method of claim 8, further comprising modeling a signal received on the first port.

Claim 10 (currently amended): The method of claim 8, wherein the scattering matrix uses values that are related to the dielectric constant of a material in which the transmission line is embedded.

Claim 11 (original): The method of claim 8, wherein the transmission line is a line on an electronic circuit board or an integrated circuit chip.

Claim 12 (currently amended): The method of claim 8, wherein the transmission line is simulated using circuit simulation software.

Claim 13 (currently amended): The method of claim 8, wherein the ~~step of modeling the dielectric loss comprises using a two-by-two matrix described as:~~ scattering matrix ~~[S]~~ is described by the equation:

$$[S] = \begin{bmatrix} 0 & \exp\left(-\dfrac{\pi f\sqrt{\varepsilon_r^{'}}\tan\delta}{c}\cdot l\right) \\ \exp\left(-\dfrac{\pi f\sqrt{\varepsilon_r^{'}}\tan\delta}{c}\cdot l\right) & 0 \end{bmatrix}.$$

Claim 14 (currently amended): A computer-readable medium having computer-executable instructions for performing a method for modeling transmission lines, the method comprising:

modeling a resistance, a self-inductance, and a self-capacitance for a transmission line as a lumped element circuit having a first and second port, where a signal is received on the first port; and

modeling a dielectric loss as a scattering matrix connected to the second port.

Claim 15 (original): The medium of claim 14, wherein the scattering matrix uses values based upon a low-loss condition wherein the intrinsic impedance of the line is unaffected by losses, whereby the reflection coefficients for the first and second ports are defined to be zero if the scattering matrix is normalized to the intrinsic impedance.

Claim 16 (original): The medium of claim 14, wherein the scattering matrix uses values that vary with a frequency of the signal.

Claim 17 (currently amended): The medium of claim 14, wherein the scattering matrix uses values that are related to the dielectric constant of a material in which the transmission line is embedded.

Claim 18 (currently amended): The medium of claim 14, wherein the method further comprises calculating the resistance, inductance, and capacitance, and wherein the ~~steps of~~ modeling comprise using circuit simulation software.

Claim 19 (original): The medium of claim 14, wherein the method further comprises modeling a skin effect resistance and a skin effect inductance using an R-L tank circuit connected to the second port.

Claim 20 (currently amended): The medium of claim 14, wherein ~~the step of~~ modeling the dielectric loss comprises using a two-by-two matrix [S] described as:

$$[S] = \begin{bmatrix} 0 & \exp\left(-\frac{\pi f\sqrt{\varepsilon_r'}\tan\delta}{c}\cdot l\right) \\ \exp\left(-\frac{\pi f\sqrt{\varepsilon_r'}\tan\delta}{c}\cdot l\right) & 0 \end{bmatrix}.$$